

**Citizen's Guide to the  
Case-Control Study of Childhood Cancers in Dover Township:  
Interim Report  
December, 1999**

## **Part 1: Study Methods**

- What is the purpose of the study?*** The Case-Control Study of Childhood Cancers in Dover Township (Ocean County) is an exploratory epidemiologic study. Its purpose is to identify possible risk factors that might explain why there has been an increased rate of certain childhood cancers in Dover Township.
- How was the study conducted?*** An epidemiologic study measures the relationship between a risk factor and a disease. This epidemiologic study uses the case-control method, which is considered the best way of studying rare diseases. Case-control studies compare individuals with a disease or condition (cases) to individuals without the disease (controls) in an effort to identify differences that may have affected disease development. Investigators gather and compare information regarding risk and exposure factors that existed prior to the development of disease in the cases and a similar period in the controls.
- The Case-Control Study of Childhood Cancers in Dover Township (Ocean County) consists of two parts: an Interview Study, and a Birth Records Study.
- Why was the Interview Study done, and how was it performed?*** An interview is one way to gain information about most of the potential risk factors in this study. Much of this information is often not available from other sources.
- For the Interview Study, study cases were children diagnosed with leukemia or nervous system cancers before the age of twenty years, who were diagnosed from 1979 through 1996, and who were residents of Dover Township at the time of diagnosis. Controls were children matched for age, gender and race who were living in Dover Township at the time a cancer case was diagnosed. Four controls were randomly selected through school records for each study case. Families of all forty eligible case children and 159 control children participated in the Interview Study.
- A series of questions was posed to both case and control families to learn if there were any differences in potential risk factors. A structured telephone interview with parents or guardians was conducted by New Jersey Department of Health and Senior Services (NJDHSS) staff. All interviews were conducted between March 1998 and January 1999.



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***Why was the Birth Records Study done, and how was it performed?***

There was concern among community members that children born in Dover Township were being diagnosed with cancer after moving out of the area. The purpose of the Birth Records Study was to identify these children, and compare information that could be obtained from birth certificates with information on birth certificates from other children born in Dover Township who did not have cancer. Birth certificates for children diagnosed with any type of cancer in New Jersey between 1979 and 1996 were examined. Children whose mothers were residents of Dover Township at the time of the birth were eligible for the study. Cancer registries from nine other states were also queried for childhood cancer cases, to learn if any of these children were born in Dover Township.

Forty-eight cases were identified in the Birth Records Study, including 24 who were also Interview Study cases. Ten controls were randomly selected for each case, based on year of birth, gender, and mother's residence in Dover Township at the time of the control child's birth.

***What risk factors were included in each portion of the study?***

The following groups of risk factors were considered and assessed in the Interview Study:

- demographic, pregnancy and birth characteristics
- family medical history
- health, medical conditions and medical procedures
- dietary factors
- exposure to tobacco smoke and alcohol
- household exposures to chemicals, animals, and household appliance electromagnetic fields
- parental occupational data
- source of drinking water
- residential proximity to hazardous sites
- exposure to air pollutant sources.

For the Birth Records Study, only those factors that may be identified through or derived from birth certificates were evaluated as part of the case-control study. These include demographic information, and residence at birth, which was used to derive drinking water source, residential proximity to waste sites, and exposure to air pollutant sources.

The factors listed above were chosen because previous studies in other communities have also examined these possible risk factors and their relationship to childhood cancers. In addition, because of community concerns, possible environmental exposures are also being considered.

***What are the strengths and limitations of this study?***

The outcome of any epidemiologic study can be affected by the selection of cases and controls, and by the type and quality of data obtained. If unsuitable controls are selected, or if inappropriate or incomplete data are collected, comparisons made between the two groups may be difficult to interpret.

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The investigators of the Case-Control Study of Childhood Cancers in Dover Township (Ocean County) took steps to ensure that all cases were identified and included in the study, and that controls were representative of the population of children in Dover Township. The New Jersey State Cancer Registry contains accurate information on childhood cancer cases diagnosed in New Jersey. All forty case families identified as eligible cases participated in the Interview Study. Control selection was random after matching for age and gender to the case. The participation rate among control families was high, which indicates that these controls are representative of the population.

A limitation of the Interview Study is that it may be difficult for study participants to accurately recall past behaviors or experiences that were included in the questionnaire, or that parents of cases may remember their children's potential exposures to risk factors differently than parents of controls. The study attempts to reduce these differences by using identical notification and interviewing procedures for all participants; using a small number of experienced interviewers; and by not releasing copies of the questions before all interviews were completed.

Birth Records Study

The Birth Records Study reviewed records for potential cases from nine other state cancer registries. The nine states are listed by the US Census Bureau as being the destination of 70 percent of Ocean County residents who move to other states. No additional cases were identified in these states. Randomly selected birth certificates from New Jersey which were used as controls are also representative of the population. The Birth Records Study is limited to the information which is contained on the child's birth certificate.

***Who reviewed the study procedures?***

Throughout the development of the study, the New Jersey Department of Health and Senior Services (NJDHSS) and the Agency for Toxic Substances and Disease Registry (ATSDR) had non-agency, independent scientists review all procedures designed to ensure that the study would provide valid and reliable information. The NJDHSS consulted an Expert Panel of epidemiologists and cancer experts from universities, medical centers, and other government agencies, to provide critical review and comment on the procedures. The ATSDR employs a similar system of Peer Review of its procedures and documents. Finally, stakeholders (including the Citizens Action Committee on Childhood Cancer Cluster, industry representatives, environmental agencies, and local government representatives) were also invited to provide critique of the proposed methods in advance of the study.